REMARKS

Claims 1 – 17 were all of the claims in the applications as translated from the original Japanese priority application. Those claims contained several multiple dependent claims. Because applicant did not want to pay the higher fee for multiple dependent claims, those claims were amended to remove the multiple dependencies.

Several additional claims have been added to claim, in separate dependent claims, that subject matter which was originally claimed in the multiple dependent claims. Other amendments to the original set of claims have been made to more particularly set forth and distinctly claims the subject matter which applicant regards as the invention.

Several new claims have been added to claim subject matter and aspects of the invention that are disclosed in the application but were not specifically claimed in the original set of claims.

Still other new claims have been added to claim the subject matter of the original claims with greater particularity and in greater detail to afford a range of scope of the claims.

No new matter is added in any of the new claims. Support for all amendments to the original claims and newly added claims is found in the original specification and drawings.

A certified copy of the priority document, Japanese Patent Application No. 2000-332160, filed October 31, 2000, is also being filed herewith.

Dated: October 11, 2001

Respectfully submitted

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VERSION OF AMENDED CLAIMS SHOWING CHANGES MADE

Amend original claims 1 – 17, as follows:

1 (Amended). A ~~tuning fork,~~ quartz crystal tuning fork resonator, capable of vibrating in a flexural mode, the resonator comprising~~;~~ :

a plurality of quartz crystal tuning fork tines, ~~and~~ each tuning fork tine having sides and a central linear portion;

a quartz crystal tuning fork base, to which the plurality of quartz crystal tuning fork tines are attached;

at least one groove provided in the central ~~line~~ linear portion of each of ~~said~~ the plurality of tuning fork tines~~;~~ ;

at least one first electrode provided inside each groove~~;~~ ; and

at least one second electrode provided on the sides of ~~said~~ the tuning fork tines ~~, and~~ ;

such that for each tuning fork tine ~~said~~ each one of the at least one second electrode ~~having~~ has an opposite electrical polarity to ~~said~~ the electrical polarity of each one of the at least one first electrode.

2. (Amended) ~~A~~ The resonator ~~as defined in~~ according to claim 1, wherein:

the at least one first electrode inside the at least one groove of ~~the~~ a first tuning fork tine and the at least one second electrode disposed on the sides of ~~the~~ a second tuning fork tine ~~are~~ have the same first electrical polarity, and

the at least one second electrode disposed on the sides of the first tuning fork tine and the at least one first electrode inside the at least one groove of the second tuning fork tine ~~are the~~ have a second, opposite electrical polarity to the ~~said~~ first electrical polarity.

3. (Amended) ~~A~~ The resonator ~~as defined in~~ according to claim 2, wherein ~~said resonator comprises~~ the second electrode on outer facing sides of each of the first and second tuning fork tines that are each adjacent to only one other side of the same or another tuning fork tine on the tuning fork base, constitute two electrode terminals.

4. (Amended) ~~A~~ The resonator ~~as defined in~~ according to claim 1 ~~or claim 2~~, wherein the ~~grooves constructed~~ at least one groove provided on the central linear portion ~~including the central line~~ of each of the first and second tuning fork tines ~~extend~~ extends to the tuning fork base ~~coupled~~ to which each tuning fork tine is attached.

5. (Amended) ~~A~~ The resonator ~~as defined in~~ according to claim 1 ~~or claim 2~~, wherein ~~groove~~ a width W_2 ~~constructed~~ of each groove on the first and second tuning fork tines ~~are~~ is greater ~~to~~ than or equal to ~~the~~ a width W_1, W_3, measured from ~~the~~ an outer edge of the groove to ~~the~~ an outer edge of the tuning fork tine ~~W_1, W_3~~.

6. (Amended) A quartz crystal tuning fork resonator, capable of vibrating in a flexural mode, the resonator comprising~~;~~ :

a plurality of quartz crystal tuning fork tines~~;~~ ;

a quartz crystal tuning fork base, having an obverse face and a reverse face, and to which the plurality of quartz crystal tuning fork tines are attached;

a plurality of grooves provided on the quartz crystal tuning fork base where ~~said base is coupled to~~ the plurality of quartz crystal tuning fork tines are attached to the quartz crystal tuning fork base;~~,~~ and

a plurality of electrodes provided in ~~said~~ the grooves, such that there is at least one electrode in each groove.

7. (Amended) ~~A~~ The resonator ~~as defined in~~ according to claim 6, wherein:

a first set of grooves ~~are constructed~~ is provided on the obverse and the reverse faces of the tuning fork base, where ~~said base connects to~~ each tuning fork tine is attached to the base~~,~~ ; and

a second set of grooves ~~are constructed~~ is provided on the obverse and the reverse faces ~~between said first set of grooves~~ of the tuning fork base, such that there is a second groove between each adjacent pair of first grooves.

8. (Amended) ~~A~~ The resonator ~~as defined in~~ according to claim 6 ~~or claim 7~~ , wherein:

the electrodes disposed opposite each other in the thickness direction of the grooves have the same polarity, and

the electrodes disposed opposite the sides of adjoining grooves have opposite polarities.

9. (Amended) ~~A~~ The quartz crystal tuning fork resonator ~~as defined in any proceeding claim~~ according to claim 6, wherein the tuning fork base has a plurality of grooves, and ~~said grooves containing the electrodes~~ each groove contains an electrode.

10. (Amended) A ~~tuning fork,~~ quartz crystal tuning fork resonator, capable of vibrating in a flexural mode, comprising;

a plurality of quartz crystal tuning fork tines~~,~~ ;

a quartz crystal tuning fork base, to which the plurality of quartz crystal tuning fork tines are attached;

~~said~~ each of the quartz crystal tuning fork tines having step difference portions~~,~~ ;

with there being at least one first electrode on each of the ~~said~~ step difference portions~~,~~ ;

with there being at least one second electrode disposed on ~~the side~~ sides of ~~said~~ the quartz crystal tuning fork tines, and;

~~said~~ such that the at least one first electrode and the at least one second ~~electrodes being~~ electrode are of opposite electrical polarity.

11. (Amended) ~~A~~ An integrated quartz crystal tuning fork resonator, capable of vibrating in a flexural mode, comprising a plurality of individual resonators ~~as claimed in any preceding~~ according to claim 1.

12. (Amended) ~~A~~ The integrated quartz crystal tuning fork resonator ~~comprising as defined in~~ according to claim 11, wherein ~~said~~ each of the plurality of ~~flexural mode, tuning fork, quartz crystal~~ individual resonators ~~are~~ is connected to at least one other individual resonator of the plurality of resonators at ~~each~~ their corresponding respective quartz crystal tuning fork ~~base~~ bases.

13. (Amended) ~~A~~ The integrated quartz crystal tuning fork resonator ~~comprising~~ according to claim 11, wherein~~;~~

~~a plurality of flexural mode, tuning fork, quartz crystal resonators being connected and formed integrally at each tuning fork base wherein said quartz crystal resonators are coupled~~ the corresponding respective tuning fork bases of individual resonators that are connected to ~~each other at the respective tuning fork bases and having~~ one another form an angle of ~~separation of~~ from 0° to about 30°.

14. (Amended) ~~A~~ The integrated quartz crystal tuning fork resonator ~~as defined in claims~~ according to claim11~~-13~~, wherein each of the plurality of individual quartz crystal tuning fork resonators ~~have~~ has at least one of a different ~~resonator~~ shape and~~/or~~ a different electrode ~~deposition~~ configuration.

15. (Amended) ~~A~~ The resonator ~~as defined in any of the claims~~ according to claim11, ~~12 or 13~~ wherein ~~said~~ the individual resonators are ~~arranged side by side~~ electrically connected in series.

16. (Amended) ~~A~~ The resonator ~~as defined in any of the claims~~ according to claim 11~~-15~~, wherein ~~said~~ the individual resonators are electrically connected in parallel.

17. (Amended) ~~A~~ The resonator ~~as defined in any of the claims~~ according to claim 1~~-7~~, wherein the grooves ~~constructed~~ formed on the tuning fork tines ~~and/or the tuning fork~~

~~base~~ are holes or a combination of ~~the~~ grooves and ~~the~~ holes, and ~~said~~ the holes or ~~said~~ grooves and holes ~~containing~~ contain the at least one first electrodes.